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Pressure-induced amorphization in quartz is studied using the T-cup cell in SAM85 high pressure apparatus at the X17B1 beamline by x-ray diffraction. Synthetic quartz is powdered and loaded in a cylindrical sample chamber. Two layers, pure quartz and mixture of quartz and NaCl, are loaded in the sample chamber to generate different deviatoric stress in the samples. The experiment is carried out up to 20 GPa.

Analysis of the diffraction peak broadening is used to indicate the stress in the sample. As shown in Figure 1 and 2, the diffraction peaks from the pure quartz sample are much more broadened than those from the mixture of quartz and NaCl at pressure, indicating a higher stress level in the pure quartz sample. Furthermore the diffraction peaks from recovered sample of pure quartz remain broadening while the recovered sample in the mixture yields much sharper diffraction peaks. This may demonstrate that the deviatoric stress is favorable to the pressure-induced amorphization in quartz. * Work was supported by the NSF Grant#EAR 89-20239 to the Center for High Pressure Research, and US DOE contract #DE-AC02-98CH10886 to the NSLS.

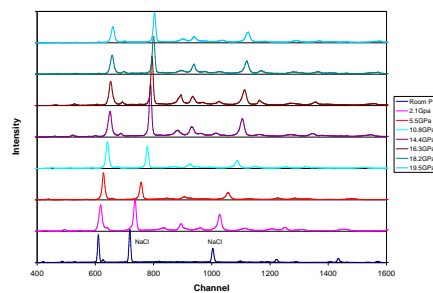


Figure 1. Diffraction patterns of quartz in the mixture with NaCl at different pressures

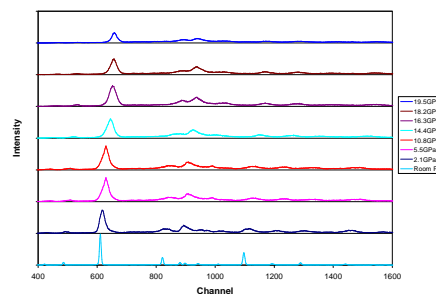


Figure 2. Diffraction patterns of quartz at different pressures